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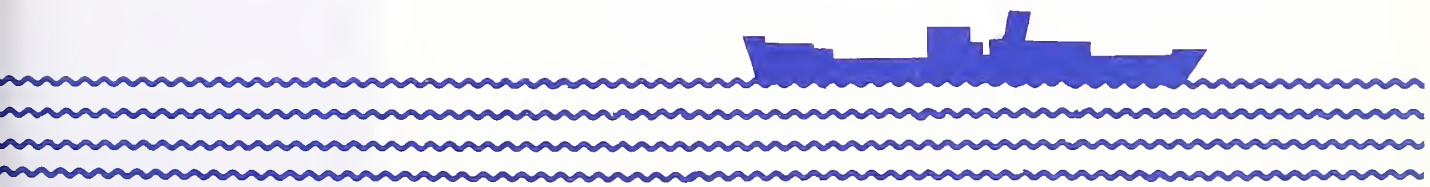
Changing Shipping Patterns on the St.Lawrence Seaway

with emphasis on UNITED STATES GRAIN EXPORTS



Marketing Research Report No. 621

U.S. DEPARTMENT OF AGRICULTURE • Economic Research Service • Marketing Economics Division

PREFACE

Major groups associated with export trade have a strong interest in the effect of the improved Great Lakes - St. Lawrence Seaway on commodity movements in both domestic and export trade.

Past studies by the Department of Agriculture on the St. Lawrence Seaway emphasized the potential savings in transportation costs in overseas trade for grain. Another study dealt with the possible impact of the Seaway on location of port elevators in the United States. The present study evaluates the traffic record of the new waterway, with emphasis on grain movement, since it opened to large ocean-going vessels in 1959. Attention is given to the total traffic volume that might be generated on the new waterway by 1968.

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Washington, D. C. August 1963

SUMMARY

Traffic on the St. Lawrence Seaway more than doubled in the period 1958-62. It rose from 11.8 million tons in 1958 to nearly 26.0 million tons in 1962. Although the increase has been spectacular so far, it has been short of expectations. If current trends continue the volume on the new waterway may not reach its expected goal of 50 million tons of cargo by 1968.

During the first year of its operation in 1959 the new Seaway carried 20.4 million tons of the expected 25 million tons of cargo. The tonnage in 1962 was 25.6 million. Traffic in bulk commodities exceeded estimates but general cargo traffic has been relatively small.

Four groups of bulk commodities--agricultural products, bituminous coal, iron ore, and petroleum--have accounted for 75 percent of the total tonnage on the Seaway since 1959. In 1959 agricultural commodity tonnage increased 2.8 million over 1958; iron ore tonnage rose 4.7 million; petroleum tonnage increased less than a million; and coal volume rose only about 100,000 tons. Agricultural tonnage continued to increase through the 1962 season. Iron ore tonnage in 1962, however, was still below the 1959 level. Other commodities by 1962 tended to stabilize at 1959 levels. General cargo was only about 10 percent of the total tonnage shipped on the waterway in the first three seasons.

Agricultural commodities were 42 percent of the tonnage moved through the improved St. Lawrence River in 1958, and 47 percent in 1961. Grain was more than 85 percent of all agricultural tonnage.

Although a lasting traffic pattern probably has not been established, completion of the Seaway has already altered the movement of agricultural commodities, particularly U. S. grain for export.

Grain shipments from U. S. Great Lakes ports directly to overseas destinations via the St. Lawrence River in 1958 were only about 100,000 tons, 4 percent of all U. S. grain exports in that year. In 1962 U. S. overseas grain shipments from lake ports were 5.8 million tons--18 percent of all U. S. grain exports.

Overseas grain shipments from Atlantic ports remained almost stable from 1958 to 1962 although total grain exports rose 70 percent. The proportion of U. S. grain exported through Atlantic ports declined from 25 percent in 1958 to 13 percent in 1962. Export grain traffic at Gulf and Pacific ports so far has not been materially affected by the Seaway. Export grain traffic at Gulf ports increased, due partially to reduced rail rates to Gulf ports.

If current trends in agricultural commodity shipments can be maintained agricultural tonnage on the Seaway may increase further by 1968 from the average of 10.1 million tons for the 1959-62 seasons.

Iron ore tonnage may also increase by 1968 from the 1959-62 average of 5.0 million tons, but it may not reach the 10.5 million tons forecast for 1959. New iron ore shipments from South America and Africa may be years away and Labrador ore, at present, is used sparingly by U. S. steel mills.

Bituminous coal traffic on the Seaway has been relatively light. U. S. coal moves in moderate quantities to eastern Canadian industrial centers where it meets sharp competition from oil and natural gas, and lesser competition from Canadian coal. Only a small increase in coal shipment is expected by 1968.

Traffic in crude petroleum and petroleum products on the Seaway so far has been light. However, because of population and industrial growth in the Great Lakes area a moderate increase in petroleum traffic can be expected.

Tonnage of general cargo is expected to increase as shippers and receivers orient their trade practices and various lake ports continue to improve their facilities. But general cargo tonnage probably will not be more than a small proportion of the total tonnage shipped on the waterway as it is now.

Total volume on the River section of the waterway by 1968 may be in the range of 35 to 40 million tons, some 20 to 30 percent below the 1968 goal of 50 million tons that was forecast in 1958.

Maintenance of the present growth in volume of Seaway traffic will depend on many factors, including the capacity of the waterway, general business conditions, the relation of Seaway shipping costs to costs on alternate routes, the routing preferences of shippers and receivers, and the membership, policies, and practices of the European Common Market.

CHANGING SHIPPING PATTERNS ON THE ST. LAWRENCE SEAWAY

With Emphasis on United States Grain Exports

Marketing Economics Division
Economic Research Service 1/

INTRODUCTION

After nearly 100 years of study and debate, the St. Lawrence Seaway became a reality in April 1959.

Before its opening to large oceangoing vessels, widely differing estimates were made on the volume of traffic on the Seaway. The most recent official estimates were made by the joint United States - Canada St. Lawrence Seaway tolls commission. This commission is responsible for setting Seaway toll rates at a level which will cover all costs of operation and maintenance, and which will provide for amortization of principal over a period not to exceed 50 years.

The tolls commission estimated that 25 million tons of cargo would move over the Seaway in 1959, and that traffic would level off at about 50 million tons a year by 1968. Bulk commodities, chiefly iron ore, grain, coal, and petroleum, were expected to be some three-fourths of the Seaway's total tonnage.

Traffic on the new Seaway so far has been short of estimates. Only 20.4 million tons of cargo moved between Lake Ontario and Montreal in 1959. Traffic in 1962 was only 25.6 million tons. Traffic in grain and some other bulk commodities far outstripped estimates; but general commodity traffic, which pays higher tolls, was below expectations.

Proponents of the Seaway believed that a definite pattern of traffic would be established well before 1968. They predicted that upbound cargoes would consist primarily of iron ore shipped from Labrador to United States and Canadian steel mills. Because of a probable shipping cost advantage via the Seaway to many foreign ports, downbound cargo was expected to be largely grain and coal. Except for coal the results so far are close to expectations.

Physical and operational factors were responsible, in part, for holding traffic below expectations. Weather conditions cut short the Seaway's initial operating season. Frequent and lengthy delays have occurred at lock entrances and in canals and channels. Labor troubles have upset shipping schedules at many ports. Some Great Lakes ports have been unable to accommodate oceangoing vessels. Expected cargoes have not materialized at some ports. Foreign vessels have not always made sufficient allowance for possible delays, and have not been able to make as many voyages into the Seaway as they had scheduled. General economic factors also affected traffic.

1/ This is a staff report prepared under the direction of Nicholas M. Thuroczy, Head of the Grains and Feeds Section of the Economic Research Service.

In this report the traffic record of the St. Lawrence Seaway, particularly traffic in agricultural commodities, is examined in some detail to determine possible future developments in commodity movements and their effects on U. S. agriculture.

THE IMPACT OF THE SEAWAY ON COMMODITY MOVEMENT

Recent Developments

The St. Lawrence Seaway is the official name of the recently improved 200-mile section of the St. Lawrence River between Lake Ontario and Montreal, Canada. 2/ It is a part of the Great Lakes - St. Lawrence Waterway which, in turn, extends eastward some 2,300 miles from Duluth, Minn., at the head of Lake Superior, to the Gulf of St. Lawrence (fig. 1).

Physical Features

A total of $471 million was spent by the United States and Canada for Seaway construction and navigational development work. Seven new locks, each 800 feet long, 80 feet wide, and 30 feet deep, have replaced the 22 smaller locks of the old waterway. River channels have been dredged to a minimum depth of 27 feet.

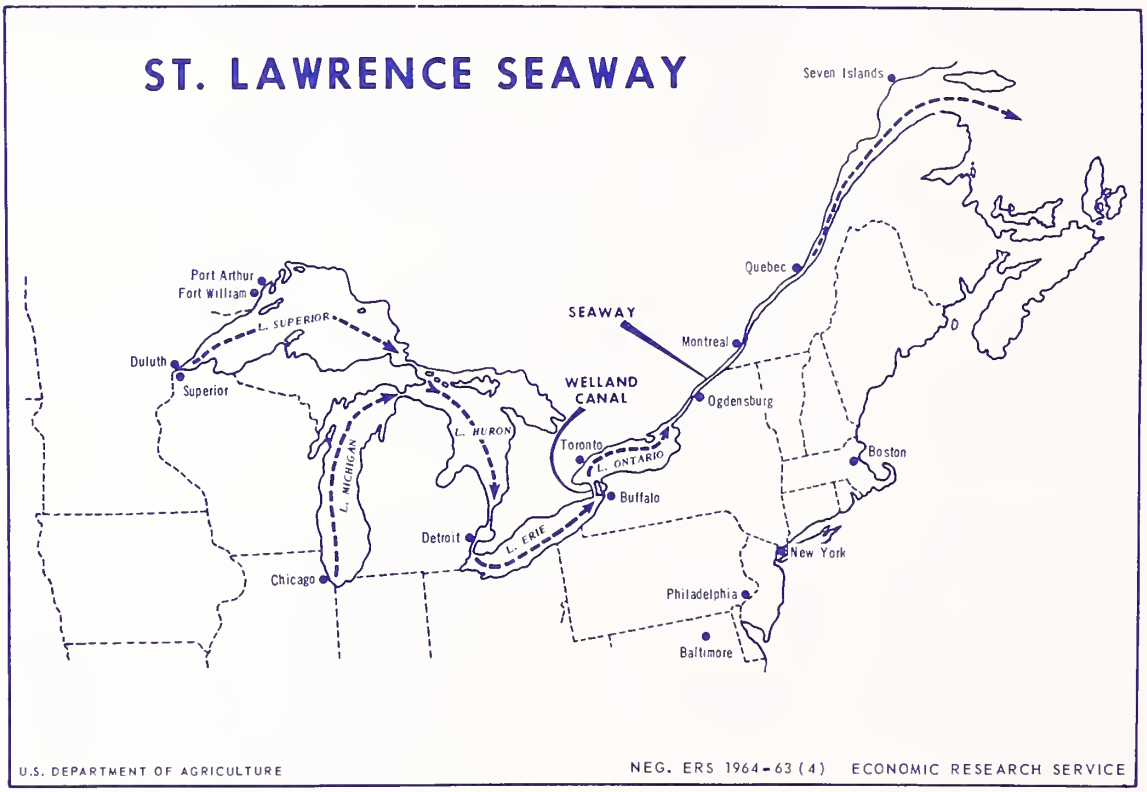

Figure 1

2/ This report frequently refers to the St. Lawrence Seaway as "River" or "Seaway."

Traffic moving from the Great Lakes into the Seaway and from the Seaway into the Lakes must move through the Welland Canal, which bypasses Niagara Falls and the Niagara River to connect Lakes Erie and Ontario. Entirely within Canada, this canal was originally built by Canada and opened to traffic in 1932. It is 27 miles long, and provides a lift of 326 feet between the two lakes. Under normal conditions, a commercial vessel can transit the entire canal in about 10 hours.

Work on the improved lakes-to-ocean route was not complete when the Seaway opened for traffic in 1959. Channels connecting the Great Lakes are still being deepened to 27 feet to permit the passage of ocean vessels, and to match the depth of Seaway channels. If work progresses on schedule, channel dredging may be completed in 1963. The U. S. Government is spending more than $65 million for dredging major Great Lakes harbors to a depth sufficient to accommodate ocean vessels.

Most students of the new waterway estimate the annual carrying capacity of the River section at 50 million tons. Its capacity is limited by that of its 7 locks, all of which are single, and the 8 locks of the Welland of which only 3 are double. Furthermore, vessels moving on the waterway are seldom evenly spaced. Bad weather may at times keep portions of the waterway nearly free of traffic while causing vessels to "stack up" at other key points. Some commodity movements are seasonal, making traffic extremely heavy at the beginning and the end of a navigation season.

Before the Seaway opened, the size of vessels operating between Lake Ontario and Montreal was severly restricted by the dimensions of the many canals and locks. Most ocean vessels using the old route could carry no more than 1,800 short tons of freight, while lake bulk freighters were limited to about 3,000 tons. 3/

The controlling depth of the improved Seaway channel is 27 feet. Because fresh water is less buoyant than salt water, extra clearance must be allowed for vessels sailing from salt to fresh water. 4/ The safe loaded salt water draft of vessels operating in the 27-foot Seaway channels has been determined to be 25.5 feet.

Thus, while vessels transiting the Seaway still encounter restrictions, the new facilities permit larger vessels to operate. Oceangoing vessels with capacities up to 9,000 tons, large upper lake bulk carriers of 22,000 tons, and specially designed lake-ocean carriers of 15,000 tons can operate on the improved lakes-to-ocean route. Seaway locks, however, will not accommodate the largest new seagoing oil tankers, the huge industrial bulk ore carriers, or some of the newer American-flag freighters.

Cargo Tonnage

Although the tonnage that moved through the Seaway in 1959 fell short of expectations by some 5 million tons or 20 percent, it was 9 million tons (80 percent) more than the average shipped in the preceding 5-year period 1954-58 (table 1).

About 85 percent of the total tonnage was bulk cargo in 1962. Such a high ratio of bulk to total shipment was unexpected.

3/ A short or cargo ton is 2,000 pounds.

4/ It is rule of thumb in the shipping trade, for example, that for every foot of draft of a 10,000 ton vessel in salt water, 1/4 inch of draft will be added in fresh water.

Table 1.--Annual tonnage shipped on the St. Lawrence Seaway, all commodities, by direction of movement, 1954-62

Season	Upbound 1/	Downbound 1/	Total
	1,000 tons	1,000 tons	1,000 tons
1954	2,974	6,663	9,637
1955	4,782	6,665	11,447
1956	5,778	7,721	13,499
1957	5,089	7,103	12,192
1958	4,670	7,092	11,762
1959	10,868	9,484	20,352
1960	8,782	11,528	20,310
1961	8,234	15,184	23,418
1962	11,880	14,714	25,594

1/ Upbound traffic moves westward toward the Great Lakes; downbound traffic moves eastward toward Montreal. Downbound traffic was heavier on both the Welland and the River section.

Dominion Bureau of Statistics. Canal Statistics, 1954-58 (annual). Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

United States cargo on the River section in 1962 was 32 percent of all shipments and Canadian cargo was 60 percent (table 2). The balance of 8 percent was foreign cargo.

Table 2.--Total shipments on the St. Lawrence Seaway by origin and destination, 1958-62

Origin and destination of shipments	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
U.S. to U.S.	29	44	47	107	129
U.S. to Canada	1,161	1,795	1,822	2,758	3,049
U.S. to foreign	347	2,759	3,917	4,477	5,004
Total	1,537	4,598	5,786	7,342	8,182
Canada to Canada	7,444	7,275	6,484	9,043	7,767
Canada to U.S.	2,073	5,761	4,577	4,080	6,407
Canada to foreign	192	823	1,387	1,245	1,167
Total	9,709	13,859	12,448	14,368	15,341
Foreign to U.S.	321	1,053	902	991	1,164
Foreign to Canada	195	842	1,174	717	907
Total	516	1,895	2,076	1,708	2,071
Grand total	11,762	20,352	20,310	23,418	25,594

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

United States shipments were predominantly downbound. Canadian shipments were almost equally divided between down and upbound and foreign shipments, of course, were all upbound.

Commodity Movements

Traditionally a great variety of commodities were shipped through the St. Lawrence Seaway. In general, after the opening of the new improved waterway in 1959, the same types of commodities continued to move (table 3).

Table 3.--Major commodities shipped on the St. Lawrence Seaway: Tonnage and percent of total shipments, 1958-62

Commodity group	Total traffic					Percentage of total	
	1958	1959	1960	1961	1962	1958	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	Percent	Percent
Agricultural commodities	4,921	7,679	8,622	11,148	11,870	42	47
Iron ore	1,526	6,187	4,315	4,017	6,015	13	24
Crude petroleum and petroleum products	1,009	1,672	1,880	1,542	1,617	8	6
Coal and coke	1,071	1,214	1,111	1,324	1,398	9	5
All other	3,235	3,600	4,382	5,387	4,694	28	18
Total	11,762	20,352	20,310	23,418	25,594	100	100

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

Four groups of bulk shipments -- agricultural commodities, coal and coke, iron ore, and petroleum -- accounted for 82 percent of the total tonnage shipped on the River in 1962, 10 percent more than in 1958. Quantities of some commodities show significant changes since 1958 (table 3). The greatest increase was in agricultural commodities, which more than doubled by 1962. Iron ore tonnage also increased. However, petroluem products and coal tonnage remained relatively stable.

Traffic in Agricultural Commodities

Agricultural commodites were expected to play an increasing role in the new waterway traffic. Agricultural commodities in 1958 were only 42 percent of the total tonnage shipped on the River (table 3). In 1962 these commodities rose to 47 percent of a much larger total cargo.

Origin of Cargo

Movement of agricultural commodities, mainly U. S. and Canadian grain, on the Seaway has been predominantly downbound (table 4). Foreign traffic in agricultural commodities was small. Only about 2 percent of all agricultural traffic was upbound.

Table 4.--Agricultural shipments on the St. Lawrence Seaway, by country of origin as a percentage of total agricultural shipments, 1958-62 1/

Country of origin	1958	1959	1960	1961	1962
	Percent	Percent	Percent	Percent	Percent
United States	3	41	44	40	52
Canada	97	57	54	58	46
Foreign 2/	3/	2	2	2	2
Total	100	100	100	100	100

1/ Exclusive of package freight.
2/ Other than Canadian.
3/ Less than 0.5 percent.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

United States traffic.--In 1958, U. S. agricultural cargoes moving through the St. Lawrence Seaway totaled only 152,000 tons (table 5). In 1959, however, after the new Seaway opened, the total rose to 3.2 million tons, and by 1962 it was over 6 million tons. About 80 percent of all U. S. agricultural cargo was grain.

The effect of the improved River facilities on U. S. foreign trade in agricultural commodities is indicated in table 6. Total United States foreign trade in agricultural commodities on the new waterway sharply increased in 1959. Since then it has increased annually by about 15 percent. U. S. port-to-port traffic in agricultural commodities has been relatively light, and so far has not been greatly affected by the River improvements. However, U. S. shipments to Canada and particularly to overseas destinations show a significant and continuing increase. Much of the increase was potential tonnage diverted from Atlantic and Gulf ports.

U. S. imports of agricultural commodities from overseas were expected to rise sharply once the Seaway was completed. They rose to 121,000 tons in 1961, but fell back to 85,000 tons in 1962. Canadian shipments of agricultural commodities to the United States via the River section of the waterway have never been important.

Canadian traffic.--Canadian agricultural commodity tonnage since the Seaway opened has not changed as much as U. S. agricultural tonnage. On the Seaway, Canadian shipments in 1962 were less than 20 percent above the 1958 volume (table 7). The increase has been small because Canada made much greater use of the waterway than the United States prior to 1959.

Table 5.--U. S. agricultural traffic on the St. Lawrence Seaway, by commodity, 1958-62 1/

Commodity	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Wheat	9	475	697	1,282	902
Corn	117	868	1,050	1,568	2,143
Oats	--	445	320	85	430
Barley	4	588	570	263	714
Flour, wheat	--	126	102	195	202
Soybeans	2	156	486	441	697
Soybean oil cake and meal	--	25	17	8	86
Beans and peas	--	67	68	46	104
Flaxseed	3	179	89	80	109
Animals and animal products	7	105	138	230	243
Syrup and molasses	--	--	1	1	1
All others	10	134	287	159	485
Total	152	3,168	3,825	4,358	6,116

1/ To U. S., Canada, and foreign destinations, exclusive of package freight. Movement predominantly downbound.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

Table 6.--U. S. shipments and receipts of agricultural commodities through the St. Lawrence Seaway, 1958-62 1/

Origin and destination 1/	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
U.S. to U.S.	1	10	3	--	--
U.S. to Canada	122	856	953	1,729	2,127
U.S. to overseas	30	2,300	2,870	2,627	3,990
Canada to U.S.	--	6	6	36	--
Overseas to U.S.	14	55	98	121	85
Total	169	3,227	3,930	4,513	6,202

1/ Predominantly downbound except overseas shipments to United States.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

Table 7.--Canadian agricultural traffic on St. Lawrence Seaway, by commodity, 1958-62 1/

Commodity	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Wheat	2,775	2,892	3,157	5,239	4,002
Corn	146	67	52	34	44
Oats	260	287	178	187	256
Barley	1,024	556	607	411	386
Flour, wheat	20	75	46	47	52
Soybeans	82	60	81	94	69
Soybean oil cake and meal	--	122	117	98	152
Beans and peas	--	2	2	13	25
Flaxseed	329	158	224	193	211
Animals and animal products	2	12	13	23	22
Syrup and molasses	--	--	--	3	3
Sugar	23	1	--	--	--
All other	88	97	110	179	195
Total	4,749	4,329	4,587	6,521	5,417

1/ To Canada, U. S., and foreign destinations, exclusive of package freight. Movement predominantly downbound.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

Canadian shipments of agricultural commodities on the waterway in 1962 were three-quarters of a million tons less than agricultural shipments by the United States. Like U. S. shipments, most Canadian agricultural shipments were downbound and most of them were grain shipments.

Foreign traffic.--The buildup, after 1958, in foreign agricultural tonnage on the St. Lawrence Seaway is shown in table 8. Although the percentage increase has been very large, foreign agricultural tonnage remains much smaller than U. S. or Canadian agricultural tonnage.

Only about 2 percent of all agricultural commodities that moved in 1962, and only about 1 percent of all traffic, was foreign in origin.

Grain Exports

Grain tonnage shipped through the improved River section has more than doubled since 1958 (table 9). In 1958, shipments of principal grains -- wheat, corn, oats, barley, soybeans, and flaxseed -- through the St. Lawrence Seaway totaled 4.8 million tons. These shipments rose to over 10 million tons by 1962. Nearly all the increase represented international trade, originating in the United States and downbound overseas.

Table 8.--Foreign agricultural traffic on St. Lawrence Seaway, by commodities, 1958-62 1/

Commodity	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Barley	--	--	--	20	--
Flour, wheat	--	--	--	13	1
Animals and animal products	5	12	10	25	42
Syrup and molasses	--	52	67	62	61
Sugar	15	114	55	131	154
All other	--	5	78	22	25
Total	20	183	210	273	283

1/ To United States and Canada, exclusive of package freight. Upbound movement.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

Table 9.--Grain traffic on the St. Lawrence Seaway, United States and Canada, 1958-62 1/

Origin	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
United States	135	2,711	3,212	3,719	5,197
Canada	4,616	4,020	4,299	6,158	4,968
Total	4,751	6,731	7,511	9,877	10,165

1/ Wheat, corn, oats, barley, soybeans, and flaxseed.

Shipping pattern.--Prior to the opening of the new Seaway, U. S. export grain produced in the Missouri River territory generally moved by rail or by river barge directly to Gulf ports for export. Most export grain produced in Western States moved by rail to U. S. Pacific ports for overseas shipment.

A large part of the export grain produced in the Northern States traditionally moved by rail to Duluth - Superior at the head of the lakes, where it was loaded aboard lake vessels for shipment to lower lake ports such as Buffalo and Oswego. Much of this grain was shipped by rail to ocean ports for export during the winter.

All-rail shipments of export grain produced in the Central States to U. S. North Atlantic ports were frequently substantial, particularly during the winter or when lake vessel rates were high.

Although more Canadian than U. S. grain moved through the St. Lawrence canals for export prior to the improvement of this waterway, the pattern of movement of Canadian export grain has also been varied.

Some Canadian export grain has always moved by rail from the Prairie Provinces to the Canadian Pacific ports for transfer to ocean vessels. 5/ A smaller tonnage has moved by rail to Churchill, Manitoba, for transfer to oceangoing vessels for export.

The major eastward movement of Canadian export grain has been by two routes. In both routes the initial movement has been by rail from the Prairie Provinces to Fort William - Port Arthur at the head of the lakes.

At the lakehead, some of the export grain was loaded on lake vessels and transported to lower lake and upper St. Lawrence River ports for transfer to canalers. Canalers then moved this grain to lower St. Lawrence River ports for final transfer to ocean vessels.

Because Canadian storage facilities on the lower St. Lawrence River were limited, some export grain received at Fort William - Port Arthur was transported by water or rail to Georgian Bay and Canadian upper lake ports for temporary storage. This grain usually moved by rail, principally during the winter months, to Canadian lower St. Lawrence River and Maritime ports for export.

Major changes in the transportation pattern for export grain from both the U. S. and Canada occurred after the Seaway was opened to traffic in 1959. Now grain can move directly to overseas destinations from many lake ports through the St. Lawrence Seaway, all but eliminating the traditional water-rail or all-rail shipments from the Great Lakes area to Atlantic ports for export.

During the 1958 season, U. S. shipments of principal grains to overseas destinations from Great Lakes ports via the St. Lawrence Seaway was negligible -- estimates place the volume at less than 100,000 tons. 6/ In 1962 the volume was 3.5 million tons.

Less than 50,000 tons of Canadian grain were shipped directly overseas via the St. Lawrence Seaway in 1958. In 1962, almost a half million tons of Canadian grain moved from the lakehead directly overseas. 7/ The deep water channel made direct overseas exports both technically feasible and economically advantageous.

U. S. port traffic.--Before the waterway was improved, little U. S. grain was exported from lake ports (table 10). Since the Seaway opened export grain shipments from U. S. lake ports have increased manyfold.

Much U. S. export grain shipped through the Seaway is destined for western European markets. Some of the increase in U. S. grain exports shipped from the lakes through the seaway in 1962 was due to the overall increase in U. S. grain exports and part was achieved at the expense of the Atlantic and perhaps the Gulf ports which normally handled a large share of grain shipments to Europe.

Because of their location with respect to grain production and to the improved new Seaway facilities, U. S. lake ports have handled increasing volumes of export

5/ Manitoba, Saskatchewan, and Alberta.

6/ Thuroczy, N. M. Impact of the St. Lawrence Seaway on the Location of Grain Export Facilities. U. S. Dept. Agr., Mktg. Res. Rpt. 442, Dec. 1960, p. 4.

7/ Dominion Bureau of Statistics. Canal Statistics 1958. Also: St. Lawrence Authority and St. Lawrence Seaway Development Corporation. Traffic Report of the St. Lawrence Seaway, 1962.

Table 10.--Grain inspected for export from U. S. port areas, 1958-62 1/

Port area	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Great Lakes 2/	841	3,452	3,971	4,536	6,275
Atlantic	5,051	4,824	4,995	5,350	4,737
Gulf	10,027	11,769	13,459	18,318	20,157
Pacific	4,588	4,315	5,836	5,235	4,375
All areas	20,507	24,760	28,261	33,439	35,544

1/ Includes wheat, corn, oats, barley, rye, flaxseed, and soybeans.
2/ Includes grain shipments to Canada.

Computed from data in Grain Market News, Weekly Summary and Statistics, 1958-62. U. S. Dept. Agr., Agr. Mktg. Serv.

grain since 1959. In 1958, U. S. grain shipments from Great Lakes ports were only 841,000 tons, about 4 percent of all U. S. grain exports (table 11). In 1962, grain exports rose to 6.3 million tons, nearly 18 percent of a much larger total volume of U. S. grain exports. Since 1959, lake exports of U. S. grain have increased on the average over half a million tons annually.

Table 11.--Grain inspected for export from U. S. Great Lakes ports, 1958-62

Ports	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Duluth - Superior	258	1,980	2,305	2,206	2,655
Milwaukee	--	--	34	207	307
Chicago	421	1,009	942	891	1,618
Carrollton	--	6	--	--	--
Saginaw	19	93	94	92	93
Huron	--	--	--	6	26
Toledo	143	361	592	1,130	1,554
Buffalo	--	3	4	4	7
Michigan City	--	--	--	--	15
Total	841	3,452	3,971	4,536	6,275
	Percent	Percent	Percent	Percent	Percent
As percent of U.S. total grain exports	4.1	14.2	14.0	13.6	17.7

Computed from data in Grain Market News, Weekly Summary and Statistics, 1958-62. U. S. Dept. Agr., Agr. Mktg. Serv.

The three ports of Duluth-Superior, Chicago, and Toledo accounted for nearly all the grain shipments from U. S. lake ports before the Seaway opened, and have continued to dominate grain export trade on the Great Lakes since then (table 11). These ports made extensive preparations for handling Seaway-induced grain traffic.

Since the new Seaway opened a considerable volume of U. S. grain has moved from lake ports to Canada for transshipment overseas. In 1958, only a small amount of U. S. lake shipments to Canada was for transshipment, but in 1962, over half of a much larger tonnage shipped to Canada was consigned to overseas destinations (table 12). These Canadian shipments are usually moved first by lake vessels through the Seaway to Montreal or other lower Seaway ports and then are transferred to ocean vessels.

Table 12.--Disposition of U. S. grain inspected for export from Great Lakes ports, 1959-62 1/

Disposition of grain	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Shipped directly overseas...	2,056	2,422	2,048	3,471
Shipped to Canada:				
For domestic use.....	2/473	995	1,246	1,287
For transshipment overseas	2/923	554	1,242	1,517
Total.....	3,452	3,971	4,536	6,275

1/ Wheat, oats, barley, rye, corn, and soybeans.
2/ Estimated.

Computed from data in Grain Market News, Weekly Summary and Statistics, 1959-62. U. S. Dept. Agr., Agr. Mktg. Serv.

Grain export traffic at several U. S. Atlantic ports has changed since 1958 because of the Seaway and other factors. Shifting of export grain traffic among the Atlantic ports and between Atlantic and Gulf ports, or changes in world demand not only for grain in general but for certain types of grain, are among the factors which may cause annual fluctuation in grain export volume. However, neither the relative share of export grain traffic of the Atlantic ports as a group nor the relative share of many individual ports within the group have been commensurate with the buildup of total U. S. grain exports since 1958. Atlantic ports as a group handled 24.6 percent of all U. S. grain exports in 1958. By 1962 their share had dropped to 13.3 percent and the annual volume was slightly smaller than in 1958 (table 13). 8/ U. S. total grain exports, meanwhile, rose from 20.5 million tons in 1958 to 35.5 million tons in 1962, an increase of 75 percent (table 10).

Norfolk and Baltimore have traditionally been the heaviest exporters of grain on the Atlantic coast. In 1962, grain exports from Norfolk were over 30 percent higher than in 1958. Baltimore and other ports, however, show a relatively steady volume since 1958 or even a decline despite a large increase in total United States grain exports.

8/ Atlantic ports were handling a declining share and Gulf ports a rising share of grain exports before the opening of the new waterway.

Table 13.--Grain inspected for export from U. S. Atlantic ports, 1958-62

Ports	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Portland, Maine	25	21	21	48	17
Boston	326	352	299	305	139
Albany	645	287	378	354	295
New York	258	438	222	116	66
Philadelphia	776	660	546	767	925
Baltimore	1,463	1,553	1,627	1,659	1,191
Norfolk	1,556	1,492	1,881	2,097	2,104
Richmond	--	21	21	4	--
Total	5,049	4,824	4,995	5,350	4,737
	Percent	Percent	Percent	Percent	Percent
As percent of U.S. total grain exports	24.6	19.8	17.7	16.0	13.3

Computed from data in Grain Market News, Weekly Summary and Statistics, 1958-62. U. S. Dept. Agr., Agr. Mktg. Serv.

Undoubtedly, the Atlantic ports, with the exception perhaps of Norfolk, have felt the pull of the Seaway on their grain export traffic and, moreover, they felt it early. In May 1958, 381,000 tons of grain were inspected for export at Atlantic ports and only 54,000 tons at lake ports. 9/ One year later in May 1959, the first full month of Seaway operation, 299,000 tons of grain were inspected at Atlantic ports and 487,000 at lake ports.

As a result of a reduction in freight rates made in June 1959 by Eastern railroads on export grain shipped from interior points to Atlantic ports, the volume of export grain handled by Atlantic ports picked up temporarily. Reduction in rail charges on grain by Western roads whose lines terminated on the Great Lakes soon followed. This almost nullified the effect of the June reduction by Eastern railroads. These rail rate changes and the continued competition of the Seaway and Gulf ports did not permit the Atlantic ports to benefit fully from the continuous increase in total U. S. grain exports. Some Atlantic ports, of course, fared better than others. For example, Norfolk has a unique position among Atlantic ports because a portion of its grain exports comes from local supplies. Nevertheless, the declining share of grain exports continues to be a matter of concern to many port authorities on the Atlantic coast.

Loss of grain traffic to the Seaway was feared by most Gulf ports before the improved waterway began operations in 1959. Grain exports from Gulf ports as a group have increased, not declined (table 14). Moreover, unlike Atlantic ports, since 1958 Gulf ports as a group have handled an increasing proportion of the steadily rising national grain export total. In 1958, Gulf ports handled 48.9 percent of all

9/ U. S. Dept. Agr., Agr. Mktg. Serv. Grain Market News, Weekly Summary and Statistics.

Table 14.--Grain inspected for export from U. S. Gulf ports, 1958-62

Ports	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Destrehan	--	--	--	667	4,141
Mobile	929	1,135	871	845	610
New Orleans	3,360	3,584	4,570	5,744	5,257
Port Allen	1,475	2,001	2,315	2,578	3,112
Pascagoula	--	--	--	--	925
Port Arthur	723	929	1,168	1,548	1,162
Houston	1,518	2,038	2,237	3,131	2,484
Galveston	1,942	1,865	2,151	3,453	2,233
Corpus Christi	80	218	146	352	233
Total	10,027	11,770	13,458	18,318	20,157
	Percent	Percent	Percent	Percent	Percent
As percent of total U.S. grain exports	48.2	48.3	47.6	54.8	56.7

Computed from data in Grain Market News, Weekly Summary and Statistics, 1958-62. U. S. Dept. Agr., Agr. Mktg. Serv.

U. S. export grain. In 1962, they increased their share to 56.7 percent of all U. S. grain exports.

A large volume of export grain comes to the Gulf by river barges operating between the grain-producing areas of the Central States and the Gulf. For many years, much of the grain exported through the port of New Orleans originated closer to Great Lakes ports than to New Orleans. The dominance of New Orleans in the grain trade has resulted largely from the economies of barge transportation.

The Gulf's favorable position in the grain trade is partly due to port improvements and sales promotions which have been pushed in recent years in expectation of Seaway competition.

Although U. S. Pacific ports may have lost some export grain tonnage to the Seaway in 1959, the competitive effect of the new waterway has been negligible. In 1958, the 11 major Pacific ports shipped 22.4 percent of all U. S. export grain (table 15). In 1959, their share dropped to 17.7 percent, and in 1962 to 12.3 percent. The decline may be attributed to factors other than the competition of the Seaway, such as changes in the location of buyers, and changes in freight rates from production areas.

Prospects.--Much export grain shipped through the Seaway so far has been consigned to western Europe, an important outlet for some U. S. and Canadian grain. 10/ Because of the location of grain production areas in the two exporting countries, and because of the demonstrated cost advantage of shipping through the

10/ Thuroczy, N. M. Impact of the St. Lawrence Seaway on the Location of Grain Export Facilities. U. S. Dept. Agr. Mktg. Res. Rpt. 442. Dec. 1960.

Table 15.--Grain inspected for export from U. S. Pacific ports, 1958-62

Ports	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Los Angeles	--	--	--	8	--
San Diego	--	7	3	--	1
Long Beach	15	19	7	36	19
San Francisco	129	75	18	86	49
Oakland	35	1	38	40	16
Stockton	483	277	194	212	346
Portland	1,483	1,638	2,050	1,741	1,634
Astoria	53	32	6	1	--
Vancouver	748	687	1,052	790	638
Longview	684	697	970	981	772
Tacoma	342	274	686	579	273
Seattle	615	608	812	762	492
Kalama	--	--	--	--	136
Total	4,587	4,315	5,836	5,236	4,375
	Percent	Percent	Percent	Percent	Percent
As percent of total U.S. grain exports	22.4	17.7	20.7	15.6	12.3

Computed from data in Grain Market News, Weekly Summary and Statistics, 1958-62. U. S. Dept. Agr., Agr. Mktg. Serv.

Seaway during the first four seasons, the volume of grain exported to Europe through the waterway has been increasing.

Canadian shipments to European markets have been declining in recent years, but trade with Asian countries, particularly wheat trade, has been strong. Because of congestion at Canadian Pacific Coast ports, some Canadian grain which would normally move through these ports to Far Eastern destinations was shipped through the Seaway in 1960. This movement, however, will be discontinued as west coast port congestion is relieved.

Utilization of feed grains by meat animals is on the rise in Europe. This factor is expected to offset any decline in per capita consumption of grain in those countries where personal incomes are increasing.

Per capita consumption of grain for food is rising in many deficit and underdeveloped areas of the world. The United States, under the Agricultural Trade Development and Assistance Act (P. L. 480) has been shipping large quantities of grain to such areas. Government grain shipments, however, have so far been consigned largely to Asian countries, and shipments to these destinations move mostly from Gulf and Pacific ports.

Attention is currently being directed toward U. S. assistance to certain countries in South America. Grain shipped to these countries, particularly those on the east coast, could move through the Seaway under present conditions. Atlantic and Gulf ports, of course, could share in the traffic.

World population is expanding, bringing greater demand for food and fiber. Domestic grain crops in many importing countries continue to be small and generally of low quality.11/ World demand, therefore, can be expected to maintain grain trade at steadily increasing levels, barring armed conflict or severe political or economic upheavals.

In view of the probable increase in world demand for grain, Seaway tonnage could increase proportionately. Although Gulf ports may also look for larger volume in export grain in the future, Atlantic ports may not fully benefit from the potential expansion of U. S. grain exports.

Traffic in Other Commodities

Tonnage of agricultural products on the Seaway has increased sharply each year since 1958. In 1962 nearly 12 million tons of agricultural products moved on the waterway, representing some 47 percent of all tonnage. In ascertaining future developments in agricultural commodity movements, consideration must also be given to movements of other major commodity groups on the waterway. The carrying capacity of the Seaway is limited at the present time to about 50 million tons annually. Should shipments of other than agricultural commodities increase to the point where cargo and water space becomes limited, future expansion of agricultural commodity shipments may be inhibited.

Iron Ore

The decline in the domestic supply of high-grade iron ore in recent years has required the United States steel industry to locate new sources. This circumstance was also a major argument for construction of the St. Lawrence Seaway.

Canadian iron ore dominates Seaway iron ore traffic. Shipments originating mainly from Labrador have been principally upbound, most of which have moved into the Welland and to the lakes for delivery to United States and Canadian steel plants. Only a small amount of iron from foreign sources, other than Canada has moved on the Seaway.

Proponents of the waterway believed that iron ore would provide a significant and increasing proportion of the tonnage carried on the Seaway. The St. Lawrence Seaway Development Corporation estimated that 10.5 million tons of iron ore would move over the waterway in 1959, its first full year of operation. The Canadian Department of Transportation and Commerce and the Great Lakes-St. Lawrence Association estimated that 5 to 10 years after the Seaway's completion, 20 million tons of iron ore would move through the waterway annually for use in midwestern steel centers.

Seaway traffic in iron ore was far short of the expected 10.5 million tons in 1959 (table 16), although there was a major increase over 1958. The volume in 1962 was still about 4.5 million tons below the initial expected tonnage.

11/ U. S. Dept. Agr. The World Food Budget, 1962 and 1966. Foreign Agr. Econ. Rpt. 4. Revised January 1962.

Table 16.--Iron ore traffic on St. Lawrence Seaway by origins and destinations, 1958-62 1/

Origin and destination of shipments	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
U.S. to Canada	--	--	--	--	61
U.S. to Foreign	--	--	--	171	15
Total	--	--	--	171	76
Canada to Canada	203	1,180	244	352	121
Canada to U.S.	1,324	4,992	4,019	3,478	5,809
Canada to Foreign	--	--	--	16	--
Total Canada	1,527	6,172	4,263	3,846	5,930
Foreign to U.S.	--	--	52	--	9
Foreign to Canada	--	15	--	--	--
Total Foreign	--	15	52	--	9
Grand total Seaway	1,527	6,187	4,315	3,974	6,015

1/ Predominantly upbound movement.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

Changes in iron ore shipments since 1958 must be interpreted with caution. Shipments in 1958 were abnormally low because of the business recession in the United States. In 1959, work stoppage in the steel industry in the United States restricted the movement of iron ore on the Seaway. Tonnage in 1960 was down sharply because of the economic slowdown in the United States. Traffic early in 1961 did not fully recover because of heavy stockpiles by steel companies. Because of these factors it is too early to observe any trend in iron ore shipments on the waterway.

Thus far, there seems to be no indication that a volume of 20 million tons of iron ore can be attained by 1968. Much of this forecast was based on increased shipments of Labrador ore and shipments originating in the newly developed mines of Africa and South America. Steel industries in the United States are using Labrador ore rather sparingly at this time despite the rush to get the Labrador fields into production. Iron ore shipments from the newly developed mines of South America and Africa appear to be years away. But even if this ore begins to move north, Baltimore and Philadelphia, which have excellent handling facilities to serve nearby steel mills will perhaps obtain the bulk of this shipment. Thus it is likely that iron ore shipments on the Seaway will increase only moderately in the future.

Bituminous coal

Bituminous coal movements on the Seaway have been about equally divided between the United States and Canada. In 1962 total coal tonnage was a little over a million (table 17). Completion of the Seaway was expected to increase substantially the volume of U. S. coal shipped by water to Canada. The St. Lawrence Seaway Development Corporation estimated that 3.7 million tons of coal would move through the improved waterway annually. The Canadian Department of Trade and Commerce foresaw annual coal traffic totaling 4.2 million tons, 5 to 10 years after the Seaway's completion.

Table 17.--Traffic in bituminous coal on the St. Lawrence Seaway by origins and destinations, 1958-62 1/

Origin and destination of shipments	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
U.S. to Canada	821	712	698	577	546
U.S. to Foreign	--	--	--	--	3
Total U.S.	821	712	698	577	549
Canada to Canada	207	404	322	572	636
Canada to U.S.	--	58	--	6	--
Canada to Foreign	--	1	--	--	--
Total Canada	207	463	322	578	636
Foreign to Canada	--	14	--	--	--
Total Foreign	--	14	--	--	--
Grand total Seaway	1,028	1,189	1,020	1,155	1,185

1/ Predominantly downbound shipments. Smaller quantities of Canadian coal shipments to Canada moved upbound.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

Coal shipments on the waterway have changed little since the Seaway opened (table 3). Current tonnage is only about one-fourth of the expected volume. It is difficult to visualize a fourfold increase in coal tonnage on the Seaway by 1968, because some U. S. coal is shipped to Canada by rail, and U. S. coal competes with Canadian oil, natural gas, and coal.

Petroleum

Most traffic estimates made before the St. Lawrence Seaway was completed indicated that petroleum tonnage shipped on the improved waterway would differ little

from that shipped on the old St. Lawrence canals. Current indications are that the established pattern of crude petroleum and petroleum product shipments on the new waterway has not changed significantly.

Products such as gasoline, fuel oil, lubricating oils, and greases make up the bulk of petroleum shipments on the waterway. Most of these shipments are Canadian in origin and are shipped to Canada and the United States. U. S. petroleum products, smaller in volume, move largely from U. S. lake ports to other U. S. lake ports or downbound through the River section to other U. S. distributing centers.

Most of the petroleum traffic is interlake, moving between U. S. and Canadian ports (table 18). In recent years, small quantities of foreign crude oil went to Canada, mainly from the Middle East and Venezuela.

Petroleum traffic on the Seaway may increase somewhat because of population and industrial growth in the areas served by the waterway. Over the long run, however, the economies of pipeline transportation for large volumes seem certain to limit waterborne petroleum movements as consumption expands. As a result, petroleum tonnage will contribute only slightly to the total tonnage expected to move on the waterway in coming years. Seaway petroleum tonnage, moreover, will move primarily between points in Canada, between points in the United States and to and from points in the United States and Canada.

Table 18.--Traffic in crude petroleum and petroleum products on the St. Lawrence Seaway by origins and destinations, 1958-62 1/

Origin and destination of shipments	1958	1959	1960	1961	1962
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
U.S. to U.S.	27	24	43	95	129
U.S. to Canada	3	47	29	14	20
U.S. to Foreign	--	5	18	14	21
Total U.S.	30	76	90	123	170
Canada to Canada	930	1,080	1,002	1,150	1,172
Canada to U.S.	47	71	68	61	34
Canada to Foreign	--	2	1	--	7
Total Canada	977	1,153	1,071	1,211	1,213
Foreign to U.S.	--	85	47	24	1
Foreign to Canada	3	359	674	183	233
Total Foreign	3	444	721	207	234
Grand total Seaway	1,010	1,673	1,882	1,541	1,617

1/ The heaviest shipments are upbound, particularly those originating in Canada.

Dominion Bureau of Statistics. Canal Statistics, 1958. Also: St. Lawrence Seaway Authority and St. Lawrence Development Corporation. Traffic Report of the St. Lawrence Seaway, 1959-62 (annual).

General Cargo

General cargo has been only a small proportion of all the tonnage moved through the Seaway so far. In 1962, such cargo totaled 2.5 million tons, 10 percent of the total shipped through the River section. General cargo tonnage on the Seaway probably will continue to increase as waterway traffic approaches its full potential but it will be only a small fraction of total Seaway traffic.

Inbound general cargo on the Seaway has consisted principally of automobiles, woodpulp, manufactured iron and steel products, chemicals, glass, liquors, and specialty food items. Outbound shipments from the United States have consisted largely of manufactured food products, machinery, manufactured iron and steel products, and electrical and other equipment. Canadian shipments have been principally scrap iron and steel, food products, and animal and poultry feeds.

Seaway exports of such general cargo items as manufactured iron and steel products, machinery, electrical goods, packaged and frozen foods, and chemicals are the result of active European demand. Many of these products, however, are now competing directly with similar ones produced in growing volume by European manufacturers.

Ocean ports, because of superior handling facilities and more frequent ocean vessel service, still handle a large proportion of all U. S. imports and exports of general commodities. However, more and better facilities for handling general cargo are being provided at Lake and River ports. Furthermore, the elimination of transshipment of cargoes using the Lakes-Seaway route reduces losses and handling costs.

THE PROBABLE IMPACT OF OTHER FACTORS

Among the most important general factors which will affect Seaway traffic are the capacity of the waterway, policies and practices of the European Common Market, general business conditions, changes in shipping costs, and routing preferences of shippers and receivers. The combined effects of these factors are likely to be the major determinant of growth in Seaway traffic over the next 10 years.

Capacity of the Waterway

The traffic-handling capacity of the Welland Canal will be a primary factor governing the volume of tonnage that will move through the St. Lawrence Seaway. Traffic on the Welland in the 1962 season was only about 60 percent of the estimated total capacity of 60 million tons. Over two-thirds of the total tonnage on the Welland moved downbound toward the River section of the waterway.

So far, the capacity of the Great Lakes-St. Lawrence Seaway has been sufficient to accommodate current traffic. However, should future traffic build up enough to cause extreme operating difficulties, the capacity of the waterway could be increased. The twinning of the five single locks on the Welland, the building of a new canal entirely within the United States paralleling the present Welland Canal, keeping the entire Seaway navigable the year around, and levying tolls on vessels in ballast or only partially laden, are some of the steps that could be undertaken to increase the capacity of the waterway. Thus the capacity of the waterway will not inhibit the expansion of Seaway traffic unless a drastic increase in volume develops. Such an increase in the near future is not likely.

European Economic Community

The European Economic Community (EEC) or Common Market, was founded in 1958. Member countries were France, West Germany, Italy, Belgium, the Netherlands, and Luxembourg. One purpose of the union was to create an economic unit of Continental nations with no tariffs among members, but a common tariff against non-members.

Because U. S. and Canadian import-export traffic with Europe and particularly with the Common Market has been important on the Seaway, the trade policies of the EEC will affect commerce on the waterway.

The gradual reduction of internal tariffs, which will be completely effective by 1970, has already forced businessmen in Common Market countries to compete vigorously with one another. They are reportedly developing new markets, building modern plants, and cutting prices. Increasing efficiency and extensive sales promotion by Europeans may make competition within Europe and elsewhere increasingly challenging for U. S. exporters.

U. S. exporters will find it necessary also to overcome the handicap of the Common Market's external variable levies. For some commodities in which the Common Market is deficient, such as ores, fibers, soybeans and soybean oil, and other raw materials, the variable levies may remain low. 12/ Many of these commodities have been shipped via the Seaway and therefore Seaway traffic in these commodities may be expected to increase.

U. S. exports of wheat, feed grains, and tobacco, some of which have followed the Seaway route, may be curtailed if EEC proposals on imports of these products are adopted. Possible reductions of more than 50 percent in wheat exports and as much as 70 percent in feed grain exports by 1970 to the 6 nations of the Common Market have been forecast. 13/

Exports of U. S. finished products such as chemicals, steel, machinery, electrical equipment, and motor vehicles, many of which also have been shipped through the Seaway, are likely to be adversely affected by the variable levies of the Common Market since they compete directly with fast-growing European production (see footnote 12).

It is too early to ascertain the ultimate effects of Common Market trade policies on Seaway traffic. Future U. S. exports of farm commodities, and in turn the volume of Seaway traffic, will depend to a large extent on the variable levy rates for imports and on the internal prices of farm commodities in the countries of the EEC. If internal prices are high, the resultant high variable levies will undoubtedly reduce U. S. exports. The recently passed U. S. Trade Expansion Act may serve to cushion the adverse effects of high variable levies on our foreign trade.

12/ Schmidt, S. C. The Impact of Western European Integration of U. S. Exports: Part 1. Illinois Agr. Econ. 2(1): 1. Jan. 1962.

13/ Learn, E. W. Long Term Effects of Common Market Grain Policies. Article in the Foreign Agricultural Trade of the United States. U. S. Dept. Agr., Econ. Res. Serv. Jan. 1963

Condition of Business

Fluctuations in business activity, both foreign and domestic, may cause considerable fluctuations in the volume of traffic on the Seaway. For example, a work stoppage in the U. S. steel industry in 1959 and a business recession shortly afterward restricted inbound movement of iron ore and outbound movement of finished steel products through the Seaway.

Resumption of a faster rate of economic growth in Canada should permit the development of new industry and the expansion of established industry, particularly in the Provinces of Ontario and Quebec. Because both areas are served directly by the Seaway, the waterway's tonnage should reflect the improved business conditions.

Furthermore, recent steps taken by Canada to lower the foreign exchange value of the Canadian dollar were intended to increase exports and decrease imports. As a result of this action, certain Canadian exports via the Seaway may increase, while foreign imports of such commodities as coal and petroleum may well decrease.

Changes in Shipping Costs

Seaway toll charges cannot, by law, be altered before 1964. Tonnage on the waterway has been running behind estimates, with a consequent lag in expected toll revenue collections. Hence, there is speculation that tolls soon will be reviewed and perhaps raised. Higher toll charges may lessen the cost advantages of the Seaway route.

Competition among alternative forms of transportation may affect the volume of traffic moved through the Seaway in the future. Railroads operating east of the Mississippi River, and barge lines operating between the Central States and Gulf ports, have felt and will doubtless continue to feel Seaway competition. They are lowering freight rates.

In the late summer of 1960, over the unsuccessful protests of barge lines, other rail lines, and lake port interests, three midwestern rail lines reduced rates on grain moving from the Midwest to the Gulf. Early in 1961, several western rail lines reduced rates on wheat moving from the Great Plains to the Gulf, to make the wheat more competitive in world markets. Barge lines, too, have made rate adjustments on their north-south traffic, and have been attempting to establish joint rates with the railroads.

In addition to rate competition from the Seaway and the railroads, however, the barge lines have faced other difficulties such as joint ownership of barge lines by railroads.

How far competing transportation agencies in the United States can go or will be permitted to go in selective rate cutting remains to be seen. They cannot, of course, afford to lose much traffic unless they can replace it with other traffic equally profitable. Neither can they afford to cut rates indiscriminately to retain or to gain traffic. Further selective rate cuts by certain railroads competing for Seaway traffic, however, cannot be ruled out.

Carriers in the past have been permitted to reduce rates well below full cost, although not below out-of-pocket cost, if they could show that otherwise they would be unable to compete. It is unlikely, however, that regulatory agencies will permit

freight rates to be reduced enough to destroy competition and thereby impair service to the public.

Routing Preferences of Shippers and Receivers

Preferences of shippers and receivers as to the routing of their goods will affect the pattern of traffic on the Seaway. The Lakes-Seaway route will be preferred by some, the overland-ocean route by others.

If the Seaway route will provide cheaper transportation than the traditional overland rail or barge-to-ocean routes for many commodities, cost-conscious shippers will want to use it, particularly as competition in world markets grows more intense. Because the Seaway has been in operation for such a short time, information on savings is meager, but the Seaway appears from a cost standpoint to be challenging some ocean ports for a portion of their historical traffic.

The Lakes-Seaway route has other important advantages for midwestern shippers. One is better control of shipments. Less pilferage is likely to occur on direct shipments from the lakes than when cargoes are moved overland and left on wharves for long periods before they are loaded aboard ocean vessels. Shippers can ship in foreign vessels directly overseas, and therefore can sell more in countries with dollar shortages. Direct movement over this route requires less handling and less expensive packaging than movement by rail or barge to ocean ports where cargoes must be transferred to ocean vessels.

Despite such obvious advantages of Seaway routing, some midwestern shippers will continue to ship through ocean ports. They will be reluctant, perhaps, to interrupt for part of the year their long-time dealings with ocean port forwarders, customs brokers, export packers, and others whose services they will need during the months the Seaway is closed to traffic. Ocean ports operate the year around, and have adequate traffic volume to support at reasonable cost the specialized services required by exporters. Lake ports are closed during the winter, and the overhead of brokerage and other service firms must be earned in approximately 8 months. Moreover, because Lake ports are numerous and widely scattered geographically, few export service agencies at any one port have been able to develop facilities as extensive as those at major ocean ports.

Many shippers and receivers may never use the Lake-Seaway route because of the limitations of the shipping services offered. Some Lake ports, for example, have inadequate facilities for handling oversized or specialized cargoes. Others have not developed sufficient traffic to make it worthwhile for ocean vessels to call regularly, and those vessels which call do not service the overseas markets desired by all shippers. Because of their long experience, most ocean ports are equipped to handle a heterogeneity of products, and most major ocean ports offer frequent sailings to a great number of destinations.

The time factor may also deter some shippers from using the Seaway route overseas. The transit time for export cargoes shipped from ocean ports varies, and shipments may be delayed by weather and other factors. Cargoes shipped from Lake ports experience additional delays since traffic moves slowly through the Seaway's locks and canals. Even under the most favorable conditions, cargo shipped via the Seaway from a port on the upper Lakes to a European port such as Liverpool will arrive 2 or 3 days later than if it were shipped through the Port of New York. 14/

14/ The Federal Reserve Bank of New York. Monthly Review 43(8):139, August 1961.

The winter closing of the Seaway will influence some exporters to space out their shipments through ocean ports rather than to concentrate them during the Seaway's open season. Not all buyers know in advance what the demand for certain items may be, and thus tend to place orders only as goods are needed. Many do not have storage facilities, and are unwilling to incur storage charges on imports while awaiting buyers.

In some cases, shippers have no opportunity to choose the route their cargoes will follow to destination. Some overseas buyers may specify non-Seaway routings. And finally, the Seaway route does not always offer a saving in transportation costs for all commodities.

IMPLICATIONS OF FINDINGS

The new waterway undoubtedly has helped U. S. agriculture and industry in the Seaway tributary area.

U. S. farmers are able to sell more grain to foreign markets than ever before, partially because of the lower transportation cost of the new waterway. U. S. lake ports have been handling cargo in larger volumes than ever before. Railroads serving the Great Lakes area are carrying bulk cargo shipments, particularly grain, in mounting quantities. The steel industry along the Great Lakes has been able to obtain iron ore at a lower cost than prior to the opening of the new waterway.

At the same time American industries in other regions experienced some difficulties. Ocean ports in other areas have felt the competition of the new waterway. Port areas on the Atlantic coast and railroads serving the East did not share in the recent large increases in U. S. grain exports. Much general cargo handled previously by ocean ports was diverted to ports on the Great Lakes.

Whether the new waterway is able to maintain its beneficial effect on the tributary area will depend on the future development in traffic on the Seaway. Reaching the estimated goal of 50 million tons of traffic on the Seaway by 1968 seems doubtful.

Among the major commodity groups, agricultural products are likely to dominate Seaway traffic in the future. These are perhaps the only commodities whose tonnage by 1968 may increase materially. Traffic in agricultural commodities since 1959 has increased an average of over 15 percent a year on the St. Lawrence Seaway. If this strong trend continues agricultural traffic on the River portion of the waterway will reach about 22 million tons by 1968.

Although iron ore shipments do not show any marked trend, it is possible that the Seaway traffic in this commodity will increase moderately.

General cargo movement may increase substantially. However, even if it doubles by 1968, it would add only about 2 million tons to the average volume of 1959-62.

Even if we assume a 20-percent rise in coal shipments over the average of 1959-62, total coal traffic by 1968 would still be in the neighborhood of only 1.5 million tons. Petroleum shipments likewise may increase only moderately.

This analysis implies that even with a fairly liberal evaluation of trends in commodity movements, tonnage on the Seaway by 1968 may be well below the official forecast of 50 million tons.

The relatively slow rate of growth in the Seaway traffic may affect the Seaway and the business community in the Seaway tributary area in several ways. Current tolls were established on the assumption that the Seaway traffic will reach 50 million tons by 1968 and that with revenues derived from these tolls the cost of constructing the waterway could be repaid in 50 years. If tonnage remains below this projection and if the Seaway is to operate without subsidy, tolls may have to be raised. The Seaway would then lose part of its cost advantage as a transportation route, particularly in foreign trade. This, of course, is not the only alternative. The period of repayment of the cost of construction could possibly be extended, say, to 75 years without changing toll rates and still provide for the amortization of the investment. The slow growth of Seaway traffic may also mean the revision of plans to expand facilities in the Great Lakes area for handling increased traffic.

But from a long-range standpoint the slow rate of growth on the St. Lawrence Seaway may not be critical even if the planned 50 million tons of traffic is not reached until 10 or 12 years after the 1968 target date. Each year since 1959 more traffic has moved on the Seaway, proving that the new waterway is more economical for many shippers than other transportation routes. And the benefits to large areas in the United States and Canada will continue to be great.

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